МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ

НАЦІОНАЛЬНИЙ ТЕХНІЧНИЙ УНІВЕРСИТЕТ
"ХАРКІВСЬКИЙ ПОЛІТЕХНІЧНИЙ ІНСТИТУТ"

SECURITY MARKET

METHODICAL INSTRUCTIONS

to perform practical tasks on the topic

"The formation of the securities portfolio and the analysis of its profitability"

for students of bachelor level in 073 “Management”

РИНОК ЦІННИХ ПАПЕРІВ

МЕТОДИЧНІ ВКАЗІВКИ

до виконання розрахункового завдання за темою «Формування портфелю цінних паперів та аналіз його прибутковості» для студентів спеціальності 073 «Менеджмент»

Харків
НТУ "ХПІ"
2018

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Методичні вказівки до виконання розрахункового завдання за темою «Формування портфелю цінних паперів та аналіз його прибутковості» для студентів спеціальності 073 «Менеджмент» / уклад. Т. І. Кочетова – Харків: НТУ «ХПІ», 2018. – 28 с.

Укладач Т. І. Кочетова

Рецензент М. М. Шевченко

Кафедра менеджменту зовнішньоекономічної діяльності та фінансів

ВСТУП

Сучасні економічні реформи, акцент на макроекономічній стабілізації, всебічну приватизацію, розвиток схем приватної власності, лібералізація ринку створюють в Україні фундаментальну основу для подальшого вдосконалення інвестиційного клімату. У країні цілеспрямовано усунені бюрократичні перешкоди для інвестицій та зменшені інвестиційні ризики.

«Портфель цінних паперів» – сукупність різних інвестиційних інструментів, які збираються разом для досягнення конкретних інвестиційних цілей інвестора. Об'єкти портфельних інвестицій виконують різні цінні папери: акції, облігації, деривативи, цінні папери, ощадні сертифікати тощо.

Формуючи свій портфель, інвестор повинен мати певний механізм вибору для включення до портфелю певних видів цінних паперів, тобто мати можливість оцінювати якість їх інвестицій за допомогою методів фундаментального та технічного аналізу.

Основним завданням цих методів є виявлення серед безлічі цінних паперів тієї їх сукупності, в яку можна інвестувати кошти, не піддаючи свої вкладення високому ризику. На практиці існує стійка залежність між ризиком і прибутковістю вкладень: чим вища доходність, тим вище ризик.

Основною метою портфеля є досягнення оптимального поєднання ризику та прибутку для інвестора, тобто відповідного набору інвестиційних інструментів, призначених для мінімізації ризику втрат та максимізації його доходів.

Метою цієї роботи є консолідація, поглиблення та систематизація наукових знань та практичних навичок студентів з інвестицій, в результаті вивчення дисципліни «Ринок цінних паперів».

Мета та обсяг роботи для визначення наступних проблем:

- навички пошуку та залучення інформації, необхідної для прийняття інвестиційних рішень;
- консолідація навичок приймати обґрунтовані рішення в умовах невизначеності та ризику, непередбаченої ситуації, ситуаційного підходу до розробки варіантів альтернативних інвестицій;
- розробка методів розрахунку з використанням комп'ютерних пакетів прикладних програм.

INTRODUCTION

Modern economic reforms, the focus on macroeconomic stabilization, comprehensive privatization, development of schemes of private property, market liberalization create in Ukraine a fundamental basis for further improvement of the investment climate. In the country purposefully eliminated bureaucratic obstacles to investment and reduced investment risks.

«Securities portfolio» is a collection of various investment instruments, which are collected together to achieve specific investment objectives of the investor. Objects of portfolio investments perform various securities: stocks, bonds, derivatives prices, securities, savings certificates, and so forth.

Shaping your portfolio, the investor should have some mechanism for selecting for inclusion in the portfolio of certain types of securities, i.e., be able to evaluate their investment quality by using methods of fundamental and technical analysis.

The main objective of the method is identifying among a variety of securities the aggregate, in which you can invest without putting their investment at high risk. In practice, there is a strong relationship between risk and return investment: the higher the yield, the higher the risk.

The main goal of the portfolio is to achieve optimum combination between risk and income for the investor, i.e., the appropriate set of investment instruments designed to reduce to a minimum the risk of loss and to maximize its income.

The aim of this work is to consolidate, deepen and systematization of scientific knowledge and practical skills of students on investment, as a result, of studying the discipline "securities Market".

Aim and scope of the work to determine its following problems:

- the skills of finding and attracting information necessary for making investment decisions;
- the consolidation of skills to make informed decisions in conditions of uncertainty and risk, contingency, situational approach to the development of alternative investment options;

- the development of calculation methods using computer packages of applied programs.

1. GENERAL PROVISIONS

In the course of task performance, it is necessary:

1. To generate a portfolio of securities with the budget of 30000 euro within USA, Europe, Ukraine and Russia markets;
2. To prove a choice of the companies and kinds of securities;
3. To describe methods of forming portfolios;
4. To track dynamics of change of course cost of the chosen financial instruments;
5. To draw conclusions about the profitability of this portfolio and the risks associated with this type of investment.
6. To issue materials under the given task in the form of the explanatory note.

2. GRAPHIC MATERIAL

An integral part of the course project is graphic material: diagrams, charts, graphs. All the illustrations in the text are referred to as drawings.

To the obligatory illustrations of the graphic part of the course project belong:

1) graphs of changes in the yield of individual investment objects, markets and the portfolio as a whole;

2) graphs of changes in stock market indices and investment portfolio.

3. REQUIREMENTS FOR THE IMPLEMENTATION OF THE SETTLEMENT TASK

Explanatory note should contain title page of the established sample, scientific and economic overview of the tools and methods of analysis of the state of the stock market, computational and analytical part with the necessary explanations, conclusions and recommendations, as well as a list of sources used.

Explanatory note must contain the following sequence following structural elements.

The title page.

Content.

Introduction.

1. Theoretical studies of the stock market in Ukraine, USA, Europe and Russia.

2. Justification the choice of financial instruments.

3. Formation of the securities portfolio.

4. The calculation of the main characteristics of the securities portfolio.

5. Characteristics of portfolio risk and recommendations for the compensation function.

Conclusions.

References.

Application (if available).

Structural parts and explanatory notes: table of contents, introduction, etc. should be placed on separate pages and give titles that perform in all capital letters and centered symmetrically to the text.

4. METHODICAL INSTRUCTIONS

The introduction should briefly describe the object of analysis, with temporary status of the problem that caused the need for creating an investment portfolio, to formulate the goals and objectives of the job, methodological tools that will be used.

In the first section it is necessary, on the basis of the reviewed scientific and period-legal literature, to analyze the state of the modern securities market in Ukraine (the number and specialization of stock exchanges, trading volumes in the current and prior years).

Thus, it is necessary to identify trends and directions of development over time of the stock market of Ukraine, comparing it with the leading stock markets of developed countries (USA, UK, Germany, Japan) and countries with developing economies (Russia, India, China).

Analysis of the state of the stock market is based on consideration of its market conditions and the reasons that have the greatest impact on its change. The development of both the stock market itself and its infrastructure should also be investigated.

Particularly noteworthy is the study of the relationship between the various stock indices, which are designed to reflect market conditions. This helps to

implement forecasts, which are often short-term, and make appropriate trading decisions (for example, opening new or closing existing positions).

Justification of the choice of financial instruments

In this section, you need to describe instruments of the stock market of Ukraine, indicating the advantages or disadvantages of investments in certain types of securities. It is also necessary to characterize the company selected by the investor as an investment. When investing in securities, each investor seeking to maximize yield of the portfolio, however, the income is always directly proportional to the risk. Therefore, the goal of any investor is to find the most appropriate combination of these two factors.

The process of portfolio investment consists of three large segments: planning, implementation and monitoring (Fig. 4.1).

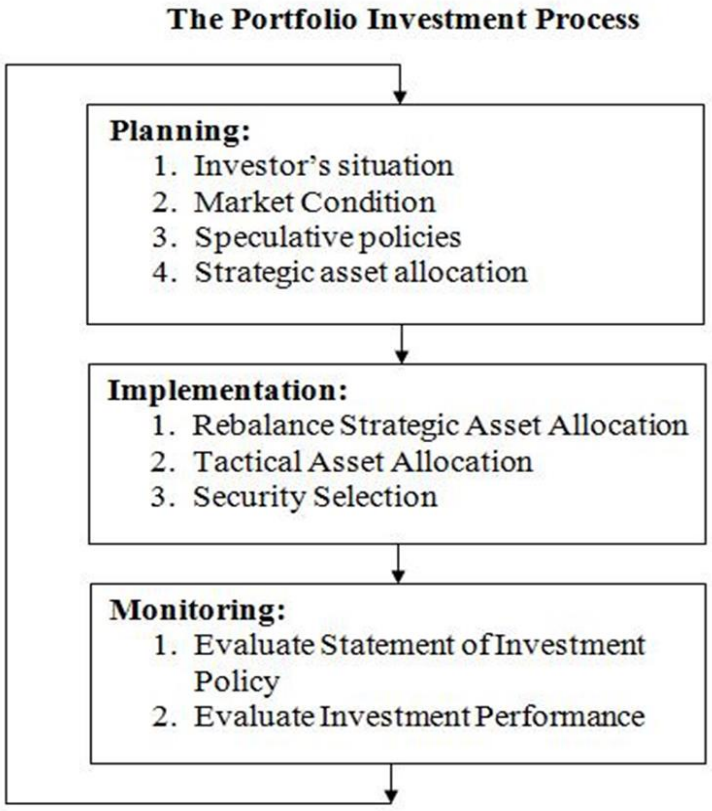

Figure – 4.1 The portfolio investment process

When planning an investment portfolio, it is necessary:

- to assess the position of the investor:
  - to define the expected portfolio liquidation;
  - to determine an acceptable level or risk;
  - to indicate whether future consumption (liability needs) are to be paid in nominal or real money, etc.
- to assess the market situation:
  - the portfolio owner must know the latest developments in the market;
  - he or she may be in a position to assess the potential of future return on various capital market instruments.
- to determine the speculative policy.

Speculative strategies may be categorized as asset allocation timing decision or security selection decision.

- make strategic asset allocation by choosing between:
  - money market investment;
  - fixed income obligations;
  - equity shares;
  - real estate investment;
  - international securities.

Next stage of the investment process is the implementation of a portfolio plan:

- **SAA (Strategic Asset Allocation)**

If the percentage holdings of various assets classes are currently different from the desired holdings, the portfolio should be rebalances to the desired SAA

- **Tactical Asset Allocation**

TAA decisions could be made across aggregate asset classes, industry classifications (steel, food), or various broad economic sectors (basic manufacturing, interest-sensitive, consumer durables).

- **Security Selection**

The only reason to overweight or underweight particular securities in the strategic asset allocation would be to off set risks the investors' faces in other assets and liabilities outside the marketable security portfolio.

Security selection, however, actively overweight and underweight holding of particular securities in the belief that they are temporarily mispriced.

Monitoring the performance of portfolio include:

- shifting from one industry to other:
- shifting from one company scrip to another company scrip;
- shifting from one financial instrument to another.

In order to identify undervalued or promising to invest funds in securities, you must analyze all represented on the Ukrainian stock market industry and under sector industries.

The analysis of the industry and the enterprise from a position of investment attractiveness consist of following stages:

- the study of macroeconomic background (change in GDP, inflation, employment and interest rates);
- expert opinion on the current and future states. Cover the share of industry in total GDP structure and its dynamics over the last 2 years;
- the consideration of the national importance of the development of the industry;
- review of export-import operations in the industry;
- SWOT– analysis of the industry

In carrying out SWOT-analysis of the industry should be established dependence on suppliers of raw materials, materials, and services, as well as the consumers of the manufactured products. It is necessary to model the relationship of these components on a certain term (preferably 1 year).

Then (in the case of the adoption of additional risk) shall be determined by other components of the SWOT– analysis and rendered a verdict on the subjective assessment of the level of investment attractiveness of the industry.

The ranking of the enterprises of the industry is based on the following criteria:

- occupied by the enterprise position on the market;
- diversification of consumers (including the consideration of an export component);
- diversification of suppliers.

Evaluation of investment attractiveness of the enterprises is made in case of search of investment objects.

Satisfactory macroeconomic background for the period of investment. The presence of certain prospects of the industry (especially important for long-term investor).

To determine the fair value of the securities used the following methods:

- Discounting (the most common approach is based on the net profit and depreciation forecast for 5-10 years with the terminal component. The discount rate is determined based on the CAPM, the cumulative approach, or alternative instruments).
- Analog method (based on the definition of financial multiples, which characterize the share or the company in general).

If the target price is higher than the current market price of the investment assets by 15 % or more, it will be assigned the recommendation "to buy ".

If the target price is higher than the current market price of the investment asset at -5 % ÷ +15 %, then it is assigned a "hold".

If the target price is below the current market price of the investment assets by 10 % and more, it will be assigned the recommendation "to sell ".

The leading indicator in determining the yield is the rate of dividend. It is mapped to the average interest rate on long-term deposits and corporate deposits. If the ratio of these two parameters is less than 1, the yield of securities will be inadequate and will lead to an outflow of investors.

Following the principle of investment is to increase investment. Large growth ensure the promotion of young companies, introducing new technologies and know-how. The average growth give long-term bonds. The slight increase provide short-term bonds.

Indicator of liquidity for the investor is the ability quickly and without loss conversion of securities into the money.

Formation of the securities portfolio

When considering the issue of creating a portfolio, the investor must determine for himself the parameters by which he will be guided.

Evaluating the combination of risk and portfolio profitability, and,

accordingly, determining the specific gravity in a portfolio of securities with different levels of risk and income is also a challenge. It follows from the general principle that operates on the stock market: the higher the potential risk is the paper, the higher the potential revenue it should have, and vice versa.

Portfolios can be classified as fixed and variable (managed).

Fixed portfolio is a collection of securities that remain for the entire period of existence of the portfolio unchanged. Typically, these portfolios are presented in government securities. Fixed portfolio allows investors to high security, but does not give a lot of revenue. So, investors, as a rule, form ***a variable securities portfolio***, which they can manage in accordance with their investment objectives. The basic principles of this formation are profitability, safety, growth and liquidity.

Depending on these principles, it is possible to classify securities portfolios into the types presented in Table 4.1.

Table 4.1 – Types of portfolio

Type of securities	**Aggressive**	**Moderate**	**Balanced**	**Conservative**
Stocks (speculative part of the portfolio)	0,7	0,45	0,4	0,15
Bonds, Bills (conservative part portfolio)	0,3	0,35	0,5	0,5
Certificates state obligations	0	0,2	0,1	0,35

In considering the creation of a portfolio, the investor should determine for itself the options that he will be guided.

1. The type of portfolio.

It is possible to build portfolios of two types:

- ✓ is oriented in a preferential income through interest and dividends;
- ✓ is aimed at a preferential increase in the market value of its constituent instruments.

2. To evaluate an acceptable combination of risk and return portfolio, and accordingly to determine the share in the portfolio of securities with different levels of risk and return.

This problem stems from the General principle that works in the stock market: the higher the potential risk borne by the paper, the higher the potential income it should be, and vice versa.

In the theory and practice of portfolio management, there are two approaches:

- ✓ the traditional;
- ✓ the modern.

Traditional or naive approach of portfolio forming assumes the usage of various financial instruments and assets during the investment process. Valuation of investment risk is conducted with the help of fundamental analysis, which is based on deep investigation of financial results of companies' activity. As much as possible industries are presented in such portfolio because diverse cyclical character of them can provide successful diversification.

The traditional approach is based on fundamental and technical analysis. It focuses on broad diversification of securities by industry. In general, the securities of well-known companies that have good production and financial performance are purchased.

Modern portfolio theory approach appeared due to Harry Markowitz, who applied econometrics methods to portfolio forming, and has created his model of portfolio optimization in 1950's. The main contribution was connected with notion that risk of assets is considered in the context of investment portfolio. Since that time a lot of portfolio optimization models such as Sharpe's model, Tobin's model, Black's model, etc were developed.

Harry Markowitz developed the basic portfolio model, which allowed diversifying and allocating stocks effectively in investment portfolio according to its two characteristics – expected rate of return and expected level of risk.

During portfolio diversification process the aspect of assets allocation takes 91, 5 % of influence on successful investing in comparison with 4, 6 % influence of assets selection. It is very important to use optimization models of modern portfolio theory, which allow searching the optimal assets weights in the portfolio.

Markowitz argues that portfolio expected return can be measured using historical data about assets average returns in previous periods respectively to their weights in this portfolio. This characteristic is computed by formula:

$$E(Rp) = \sum_{i=1}^{N} w_i r_i \ , \qquad (4.1)$$

where *E(Rp)* – expected return of an investment portfolio;

w_i – the proportion of the portfolio invested in asset i;

r_i – expected return of the ith asset;

N – the number of assets in the portfolio.

Measure of portfolio expected level of risk is based on standard deviation of assets returns in previous periods respectively to their weights in this portfolio taking into account correlation coefficients between these assets. It can be measured by formula:

$$\sigma_p = \sum_{i=1}^{n} \sum_{j=1}^{n} w_i * \sigma_i * w_j * \sigma_j * p_{ij}, \qquad (4.2)$$

where p_{ij} – linear correlation coefficient between assets i^{th} and j^{th} returns.

According to Markowitz, the investor should make a decision on the choice of a portfolio based solely on the indicators of expected return and standard deviation of return. This means that the investor chooses the best portfolio based on the ratio of the two parameters.

Investors, forming a portfolio, seek to maximize the expected return on their investments at a certain acceptable level of risk (and vice versa, to minimize the risk at the expected level of return). A portfolio that meets these requirements is called an effective portfolio. The most efficient portfolio for the investor is optimal.

The capital asset pricing model (CAPM) is based on the fact that investors who invest in risky assets expect some additional income that exceeds the risk-free rate of return as compensation for the risk of owning these assets. Such a requirement is described by the technical term “risk aversion”. Non-risk investors do not necessarily avoid it. However, they require compensation in the form of additional expected return for taking the risk on investments whose profitability is not guaranteed.

CAPM assumes that the rate of return on a risky asset is made up of the rate of return on a risk-free asset (risk-free rate) and risk premium, which is associated with the risk level for the asset.

Capital Assets Assessment Model (Sharpe Model). The expected return on the asset can be determined using the so-called index models. Their essence is that the change in profitability and asset prices depend on a number of indicators characterizing the state of the market, or indices.

Sharpe's model is often called a market model. It presents the relationship between the expected return on an asset and the expected return on a market. It is assumed to be linear. An independent random error reveals the specific risk of an asset that cannot be explained by market forces. The value of its average value is zero. In the case of a widely diversified portfolio, the values of random variables due to the fact that they change in both positive and negative direction, extinguish each other, and the value of the random variable for the portfolio as a whole tends to zero. Therefore, for a widely diversified portfolio, specific risk can be neglected.

A further increase of the portfolio is impractical, there is the effect of excessive diversification, which should be avoided. Excessive diversification can lead to such negative outcomes as:

- the impossibility of adequate portfolio management;
- purchase insufficiently reliable, profitable, liquid securities;
- increased costs associated with finding securities (cost preliminary analysis, and so on);
- high costs for the purchase of small parties of securities, etc.

The optimal is the portfolio that provides the maximum expected return for a certain level of risk and the minimum risk for some value of the expected return.

It is necessary to distinguish between the creation strategy and the portfolio management strategy.

The higher the risk in the securities market, the more requirements are presented to the portfolio manager on the quality of portfolio management. This problem is especially relevant in the event that the securities market is volatile. Management means the application to a set of different types of securities of certain methods and technological capabilities that allow: to preserve the originally invested funds; to reach the maximum level of income; ensure the investment orientation of the portfolio. In other words, the management process is aimed at preserving the basic investment quality of the portfolio and those properties that would correspond to the interests of its holder.

The first and one of the most expensive, labor-intensive elements of management is monitoring, which is a continuous detailed analysis of the stock market, its development trends, the stock market sectors, investment qualities of securities. The ultimate goal of monitoring is to select securities that have investment properties that correspond to this type of portfolio. Monitoring is the basis of both active and passive management.

An active management model involves careful tracking and immediate acquisition of instruments that meet the investment objectives of the portfolio, as well as a rapid change in the composition of the stock instruments in the portfolio.

Monitoring is the basis for forecasting the size of possible income from investment funds and intensification of operations with securities.

An active management manager should be able to track and acquire the most effective securities and get rid of low-yield assets as quickly as possible. At the same time, it is important not to allow the portfolio value to fall and its investment properties to lose, and therefore, it is necessary to compare the value, profitability, risk and other investment characteristics of the «new» portfolio with similar characteristics of the existing «old» portfolio. This method requires considerable financial expenses, since it is connected with information, analytical expert and trading activity on the securities market, where it is necessary to use a broad base of expert assessments and conduct independent analysis, to carry out forecasts of the state of the securities market and the economy as a whole.

It can afford only large banks or financial companies that have a large portfolio of investment securities and are striving to obtain the maximum income from professional work in the market.

Active monitoring is a continuous process in such a way that the process of managing a portfolio of securities is reduced to its periodic audit, the frequency of which depends on «anticipating the discount rate».

Passive management involves the creation of well-diversified portfolios with a predetermined level of risk, calculated for a long-term perspective. This approach is possible if the market is sufficiently efficient, saturated with good quality securities. The duration of the portfolio existence presupposes the stability of the processes in the stock market. In the conditions of inflation, and, consequently, the

existence, in the main, of the short-term securities market, as well as the unstable conjuncture of the stock market, such an approach seems ineffective.

The main advantage of passive control is the low level of overhead costs.

The question of the quantitative composition of the portfolio can be solved both from the position of the theory of investment analysis, and from the point of view of modem practice. According to the theory of investment analysis, simple diversification, that is, the distribution of portfolio funds according to the principle of «do not put all eggs in one basket» - is no worse than diversification by industry, enterprises, etc. In addition, the increase in various assets, that is, types securities held in the portfolio to eight or more do not significantly reduce portfolio risk. The maximum risk reduction is achievable if 10 to 15 different securities are selected in the portfolio. Further increase in the composition of the portfolio is impractical, that is, there is an effect of excessive diversification, which should be avoided.

We also do not apply such a method of passive management as an index fund method. The index fund is a portfolio reflecting the movement of the selected stock index characterizing the state of the entire securities market. If the investor wants the portfolio to reflect the state of the market, he should have in the portfolio the share of securities that these securities make when calculating the index.

Certain difficulties may arise when using the method of deterring a portfolio. This option of passive management is associated with investing in inefficient securities. At the same time, stocks with the lowest price-earnings ratio are selected, which allows in the future to receive income from speculative operations on the stock exchange. However, market instability does not provide such guarantees.

It cannot be said that only the conjuncture of the stock market determines the way the portfolio is managed.

The choice of management tactics depends on the type of portfolio. For example, it is difficult to expect a significant gain, if the tactics of "passive" management are applied to the portfolio of aggressive growth. It is unlikely that the costs of active management, oriented, for example, to a portfolio with a regular income***, will be justified.***

The choice of management tactics also depends on the ability of the manager (investor) to choose securities and predict the state of the market. If the investor does not have sufficient skills in the choice of securities or the time of the

transaction, then he should create a diversified portfolio and keep the risk at the desired level. If the investor is confident that he can well predict the state of the market, he can change the composition of the portfolio, depending on market changes and the type of management he chooses.

The costs of running too diversified portfolio will not give the desired result, since the portfolio return is unlikely to grow faster than the costs of excessive diversification.

To create a good portfolio you need: keep up with the news that affects your money; buy stocks primarily when interest rates are low; use the prime business loan interest rate to identify the safest and the best investment for each economy; watch the automobile industry; watch the unemployment rate.

The calculation of the main characteristics of the securities portfolio

According to microenvironment analysis, it is necessary to distribute the investments between the markets of the USA, Europe, Russia and Ukraine (tabl. 4.2).

Table 4.2 - Segmentation of investment by markets (example)

Market	**Proportion**	**Amount (EUR)**
America	33%	10 000 €
Europe	40%	12 000 €
Russia	17%	5 000 €
Ukraine	10%	3 000 €

The distribution of investment between chosen companies should be presented in the form table. 4.3. The shares of some companies are presented in different currencies.

Table 4.3 – Distribution of investment between companies (example)

Company	**Percentage in market**	**Amount (EUR)**	**General proportion**
Nike	56 %	5 675,87 €	19%
American Express	44 %	4 403,76 €	15%
RBS PTC	66 %	7 938,30 €	26%
Rolls Roys Holdings PLS	34 %	4 062,32 €	14%

Аэрофлот	44 %	2 175,86 €	7%
Татнефть	56 %	2 820,33 €	9%
Motor Sich	43 %	1 290,50 €	4%
Raiff Bank Ava	57 %	1 709,09 €	6%

Also during the whole period of individual assignment you should significant changes in currency exchange. To facilitate calculations, all data need transferred to the euro and presented in the form table 4.4.

Table 4.4 – Currency exchange

Data	Exchange rate		
	USD / EUR	RUB / EUR	UAH / EUR

Calculation task is performed during one semester (15 weeks) on real data. Students need to track changes in prices for the tools included in the portfolio weekly, to calculate the main indicators for individual markets and the portfolio as a whole. The resulting information should be displayed on a sample table. 4.4.

Table 4.5 - Calculation and monitoring of portfolio capitalization (example)

	US									
	McDonald's				**Amazon**					
date	exchange value	number of shares	capitalization	cash balance	exchange value	number of shares	capitalization	cash balance	**total balance of cash**	**Total** capitalization in dollars
03.09.18	164,79	45,00	7415,55	142,33	2039,51	3,00	6118,53	1439,35	1581,68	13534,08
10.09.18	165,30	45,00	7438,50	142,33	1939,01	3,00	5817,03	1439,35	1581,68	13255,53
17.09.18	159,30	45,00	7168,50	142,33	1908,03	3,00	5724,09	1439,35	1581,68	12892,59
24.09.18	163,31	45,00	7348,95	142,33	1934,36	3,00	5803,08	1439,35	1581,68	13152,03

Also weekly, it is necessary to calculate the total capitalization of the portfolio and build graphs of changes in the market value of selected investment objects, the capitalization of parts of the portfolio formed in various foreign markets and in the Ukrainian market. For example as presented at the fig. 4.2.

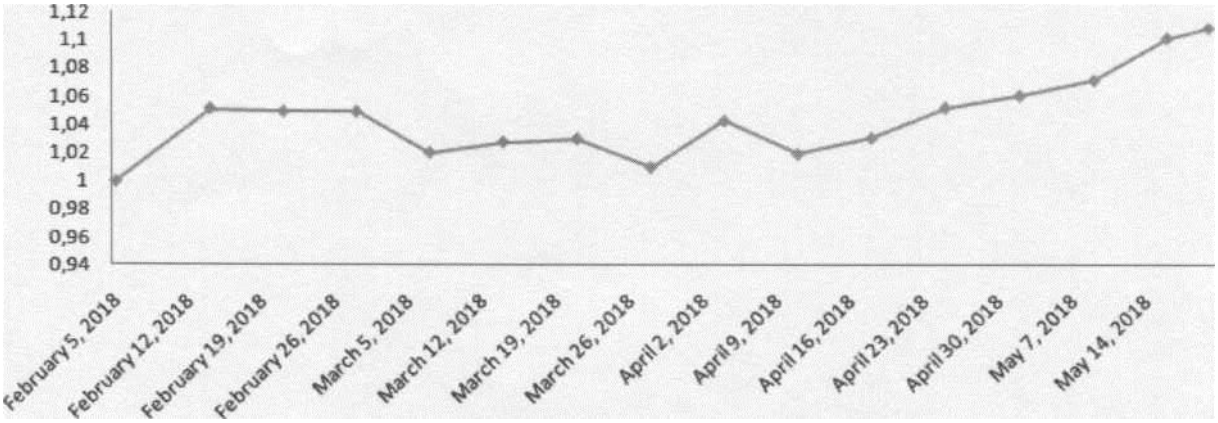

Figure 4.2 – Dynamics of changes in USA market

At portfolio formation, consider following characteristics of securities - profitableness, average profitableness, degree of risk and interdependence, which are defined because of the analysis of the big file of the statistical information on courses for the previous periods.

Let i – share number in the future investment portfolio consisting from m of kinds of shares; t – number of the moment of time (t = i, n); P_{it} – the price of the share of i-th kind at the moment of time t; div_{it} – dividends under the share of i-th kind.

Let's enter following concepts.

Profitableness of share of i-th kind during time t, in percentage (the formula 4.3)

$$K_{it} = \frac{P_{it} - P_{i1} + div_{it}}{P_{it}} * 100;$$

(4.3)

Average profitableness of share of i- th kind for the period t, in percentage:

$$\overline{K}_i = \frac{K_i + K_{i2} + ... + K_{in}}{n} = \frac{\sum_{t=1}^{n} K_{in}}{n} \quad ; \qquad (4.4)$$

Then profitableness of the formed investment portfolio represents the average size from average profitableness's of each kind of stocks (w_i – a share of actions in a portfolio):

$$\overline{K} = \sum_{i=1}^{n} w_i \overline{K}_i; \qquad (4.5)$$

Efficiency of any investment is determined based on a comparison of the effect (income) and expenses. The income is determined on the basis of the real value of private stock instruments, formed under the influence of two main indicators: the sum of the future cash flow from a particular type of stock instrument and the size of the discount rate used in estimating the present value of the future cash flow.

When you entrust your portfolio management, you should be able to monitor this person's work. Portfolio monitoring involves analyzing several factors.

- ***Management Style***

By taking the time to understand the various portfolio management styles offered on the market, you will be able to select a style that is adapted to your objectives and needs**.**

- ***Compliance***

The terms and conditions of the contract with the portfolio manager are usually confirmed in writing and identify the investment policy and management framework.

- ***Performance***

When evaluating a manager, take into account the performance history and the level of risk assumed. To evaluate the performance of your portfolio, find out what your return was last year, by account and on a consolidated basis, and then compare, based on your portfolio's asset allocation, if your results are better, the same or lower than the reference indices.

- ***Service Quality***

To assess the quality of the service you are receiving from your portfolio manager, you should meet with this person at least twice a year and document in writing the issues discussed during these meetings so that you can monitor the outcome of decisions made. The portfolio manager should also submit a complete and detailed management report on a regular basis.

- ***Administration***

You should assess the amount of the various fees paid, including: management, custodial or brokerage fees, as well as any interest charges, if applicable. You can then determine if the service you are receiving is appropriate and reasonably priced, according to your capital invested. There are significant variances between the

management fees for various products and services offered on the market (private management, mutual funds, baskets, etc.).

- ***Taxation***

Portfolio monitoring also involves taking various tax aspects into consideration such as the deductibility of the various fees incurred as well as the management of gains and losses at the end of the year. In addition, after-tax rates of returns on various types of investments must also be considered

Characteristics of portfolio risk

Investment risk can be defined as the deviation of actual income from the expected return. The investment is risk-free if the income from it is guaranteed.

Total risk is the sum of all risks associated with the implementation of any investment.

Risks of portfolio investment – the degree of the possibility that circumstances will come when investor incurs losses caused by investments in the stock portfolio, as well as operations to attract financial resources for its creation. Allocate the following risks of portfolio investment, which apply only to securities portfolios:

1. Capital risk – the total risk for all investments in securities. Losses with this type of risk are inevitable. The analysis of capital risk is reduced to an assessment of whether it is worthwhile to deal with a portfolio of securities, is it not better to invest money and other types of assets (real estate, goods. currency, etc.).

2. Selective risk – the risk of incorrect choice of securities for investment in comparison with other types of securities when creating a portfolio. The given risk is connected with wrong estimation of investment qualities of securities.

3. Temporary risk – the risk of buying or selling securities at an inopportune time, which inevitably entails losses for the investor. For example, seasonal fluctuations in securities trading, processing agricultural products of corporations and enterprises.

4. The risk of legislative changes arises in connection with the re-registration of corporations, obtaining a license for the right to conduct transactions with securities, which causes additional expenses for the issuer and investor.

5. The risk of tax changes is related to the adjustment of taxation of transactions with securities, which affects the income of legal entities and individuals – participants in the stock market. To reduce the tax risk, the company's accounting policies should use all legitimate ways to reduce the tax burden (the method of accelerated depreciation linear, accounting for material costs using the methods of Lifo and Fifo, consultations of qualified auditors, etc.).

6. Liquidity risk - is associated with the possibility of losses in the sale of securities due to a change in their quality.

7. Market risk - possible losses from the decrease in the value of securities due to a general fall in the value of securities in connection with the general fall of the macroeconomic conjuncture in the stock market.

8. Credit risk or business is observed in a situation when the issuer that issued debt (interest) securities will not be able to pay interest on them or the principal amount of debt. The credit risk of the issuer corporation requires attention from both financial intermediaries and investors. The issuer's financial position is often determined by the ratio between debt and equity in the balance sheet (financial independence ratio). The higher the share of borrowed funds in the balance sheet, the higher the probability for shareholders to remain without dividends, since a significant portion of the proceeds will go to the bank as interest for the loan. In the bankruptcy of such a corporation, most of the proceeds from the sale of assets will be directed to repay the debt to creditors - banks.

9. Inflationary risk - the risk of loss of income due to the accelerated growth of inflation compared with the income on the security.

High inflation rates, the revenues received by investors from securities are provided faster than they increase in the near future. World experience confirms that a high level of inflation destroys the securities market.

10. Interest rate risk - losses that investors may incur in connection with changes in interest rates in the credit market. The growth of the bank interest rate leads to a decrease in the market value of securities. With a low increase in interest on deposit accounts, a massive discharge of securities issued at lower interest rates may begin. These securities may be returned to the issuer ahead of schedule.

11. Revocable risk is the possible losses for an investor if the issuer withdraws its bone due to the excess of a fixed level of interest payments on them over the current mark interest.

12. Insurance risk - the risk of investing money in securities of joint-stock companies (corporations) that are under the jurisdiction of a country with an unsustainable economic situation or with an unfriendly attitude towards the country of which the investor is resident.

13. Industry risk is related to the specifics of individual industries. This risk is manifested in the change in investment qualities and the exchange value of securities and losses c investors, based on the industry's belonging to a certain type.

By degree of risk, the industries are classified into:

- ✓ subject to cyclic fluctuations;
- ✓ the risk of the corporation itself is similar to the sectoral risk and largely due to the latter.

Its contribution to the level of risk of portfolio investment introduces the type of corporate behavior. It can be a "conservative" enterprise that does not pursue an expansion strategy (takeover of other companies), but is satisfied with the won positions in the market of goods and services. Another degree of risk inherent in the securities of the "aggressive" enterprise, which chose the way of expansion of production and development of new products. "Moderate behavior" of an enterprise can combine "aggressive" and "conservative" types of behavior.

14. Currency risks of portfolio investments are connected with investments in currency securities and are caused by a change in the exchange rate of foreign currency. The losses c the investor arise in connection with the increase of the national currency in relation 1 foreign currencies.

Depending on the degree of impact on the financial position of the company distinguish valid, critical and catastrophic risk. For acceptable risk usually take the threat of complete loss of company profits. Critical risk associated with the loss of expected revenue. The most dangerous is a catastrophic risk, which leads to loss of all property and the bankruptcy of the company.

The reduction in risk is achieved through diversification of the portfolio – acquisition of a certain number of stock values. Diversification reduces the risk due to the fact that there are low income, one paper will be compensated for the high

earnings on other securities This risk is minimized by inclusion in the portfolio securities of a wide range of industries, not closely related among themselves to avoid synchronicity of cyclical fluctuations in their business activity.

Key statistical indicators that measure the risk are ***variance, standard deviation and coefficient of variation.***

Variance is called a measure of spread of possible outcomes with respect to the expected value: the higher the variance, the greater the spread.

$$\sigma^2 = \sum_{i=1}^{n} (k_i - k)^2 \cdot p_i; \quad (4.6)$$

σ^2 – variance;

k_i – the expected return of i-th possible outcome;

k – average expected return;

p_i – the probability of the i-th possible outcome;

n – the number of outcomes.

As another meter, individual variation around the average values are often used **standard deviation**, which represents the square root of the variance.

$$\sigma = \sqrt{\sigma^2} = \sqrt{\sum_{i=1}^{n} (k_i - k)^2 \cdot p_i}; \quad (4.7)$$

σ – standard deviation.

Degree of risk of the action of i- th kind during time t, in percentage:

$$\sigma_i = \sqrt{\frac{(K_{i1} - \overline{K}_i)^2 + (K_{i2} - \overline{K}_{ij})^2 + ... + (K_{in} - \overline{K}_i)^2}{n}} = \sqrt{\frac{\sum_{t=1}^{n} (K_{it} - \overline{K}_i)^2}{n}} . \quad (4.8)$$

The coefficient of variation is the ratio of standard deviation to the expected value of return. This indicator provides a standardized deviation and calculates the risk per unit of return.

$$CV = \frac{\sigma}{k} * 100; \quad (4.9)$$

CV – coefficient of variation.

Calculated data for the specified formulas for individual markets and the portfolio as a whole are recommended to be presented for samples of table. 4.6.

In some instances, you might want to compare the dispersion of two different series. The variance and standard deviation are absolute measures of dispersion.

That is, they can be influenced by the magnitude of the original numbers. To compare series with greatly different values, you need a relative measure of dispersion.

Table 4.6 – Risk of the portfolio investment

Market	**Company**	**σ2**	**SD σ**	**CV**
US	GOOGL	0,000074	0,008627	0,738432
	ORACL	0,000304	0,017441	0,574233
EU	AON	0,000040	0,006299	0,737222
	GSK	0,000791	0,028131	0,665805
RF	SBER	0,000413	0,020319	-2,48015
	BASHNEFT'	0,000872	0,029525	-0,91938
UA	AZST	0,017118	0,130836	-1,46746
	EXPO	0,001331	0,036486	-2,28035

As you can see from the table, the less risky is GOOGL shares with slight diversity, while AZST is the share with the highest possible risk. The higher the coefficient of variation (CV), the relatively larger spread and lower evenness values investigates.

In the final part should lead to conclusions and recommendations the results of the work done. To identify the causes of decline (growth) of those or other financial instruments in which investments, to predict the position of the selected companies on the stock market in the future.

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CONTENT

Навчальне видання

РИНОК ЦІННИХ ПАПЕРІВ

МЕТОДИЧНІ ВКАЗІВКИ

до виконання розрахункового завдання за темою «Формування портфелю цінних паперів та аналіз його прибутковості» для студентів спеціальності 073 «Менеджмент»

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Укладач КОЧЕТОВА Тетяна Іванівна

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